

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

This REVIEW for October, 1893, is based on reports from 3,146 stations occupied by regular and voluntary observers. These reports are classified as follows: 159 reports from Weather Bureau stations; 40 reports from United States Army post surgeons; 2,121 monthly reports from state weather service and voluntary observers; 29 reports from Canadian stations; 217 reports through the Southern Pacific Railway Company; 500 marine reports through the co-operation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service"; 154 weekly reports from 39 U. S. Life-Saving stations; 41 reports from navigators on the Great Lakes; monthly reports from local services established in all states and territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe.

CHARACTERISTICS OF THE WEATHER FOR OCTOBER, 1893.

LOW AREAS.

The principal areas of low pressure have been those attending the hurricane of the 1st and 2d in Louisiana and that which passed from the middle Atlantic October 1st to the south Atlantic coast October 12th, and thence northward over the lower lake region on the 14th; finally the depression attending the whirlwind that formed on the 21st north of the Bahamas and disappeared in Maryland on the 23d.

The first of these storms was remarkably severe and destructive over a small region in southern Louisiana and Alabama, and a great loss of life was caused by the high water that attended it.

The second was barely felt in the West Indies, as its track lay to the north of those islands; at Nassau the wind attained a storm velocity; on the coasts of Georgia, Florida, and South Carolina the storm was very severe and the ocean water rose to an unusual height; after reaching the lower lake region the storm was again very severe, being in most

places considered as the severest that has been experienced on the Lakes for many years.

TEMPERATURE.

The average temperature was in excess from 4 to 7 in the lower Saint Lawrence valley, New Brunswick, and Cape Breton, and to a less extent as we proceed westward to the upper Mississippi and lower Missouri valleys and southward to the middle Atlantic states. The temperature was below the normal about 4 or 5 in central Oregon and Washington, Assiniboia, and Manitoba and southward to the south Atlantic and Gulf States and California.

PRECIPITATION.

The precipitation was largely in excess of the normal over the northern plateau and north Pacific coast regions. It was decidedly below the normal over the middle and southern plateau, the south Pacific coast, the middle and southern Rocky Mountain slopes, western Gulf states, and Missouri Valley regions.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure reduced to sea-level for October, 1893, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown by isobars on Chart II, which also gives the so-called prevailing winds, or those most frequently observed at each station.

The normal distribution for October of atmospheric pressure and the direction of the normal wind resultant for each station is shown on Chart V. This chart has been prepared by Prof. H. A. Hazen, who has also prepared all the others of this series preliminary to the publication by the Weather Bureau of specially prepared data and charts showing the meteorological and climatic features and conditions of the United States. The pressures for both Canada and the United States are reduced to sea-level but not to standard gravity by Prof. Hazen's methods and formulæ. The wind resultants are as given by him at page 124 of his "Meteoro-

logical Tables," and are computed by Lambert's formula, giving equal weight to each observed wind without regard to its velocity.

As compared with the preceding month of September the mean pressure for October, 1893, is slightly lower in the upper lake region and the extreme south Atlantic coast, the maximum change being a fall of .09 at Jupiter Inlet, elsewhere the pressures have generally risen; the rise is .15 or more throughout the Rocky Mountain region, the maximum being .20 at Salt Lake City. A decided rise has also occurred in Maine and the Gulf of Saint Lawrence, the maximum being a rise of .15 at Grindstone Island in the Gulf of Saint Lawrence.

As compared with the normal for this month the pressures for October, 1893, have been in excess in the middle Atlantic states, New England, New Brunswick, and Nova Scotia, the maximum being from .08 to .10 in the latter provinces. Pressure has also been in excess, but to a less extent, over Texas,